

pecially as slides must always be scraped and fitted to suit the machine on which they are to be used.

The next operation would be performed in the fixture illustrated in Fig. 27. The carriage is here located by the dovetail and by the pin *B*, and held by a gib *C*, or by straps and screws, as shown. It will be noticed that, with the given design, the straps and screws must be removed each time a new piece is inserted, which is an undesirable feature of the fixture. If parts *A* in Fig. 24 project out too far, so that a light finishing cut would cause springing, they are supported by sliding points or other adjustable locating means.

If the dovetail in the slide had simply been rough-finished in the fixture in Fig. 26, the finishing of the bottom ways could have been done in the fixture in Fig. 27, and then, after having finished the bottom ways in this fixture, the work could again have been located in the fixture in Fig. 26, and the dovetail finished; this might insure more accurate work in some cases.

In the case just described, the work requires three different fixtures to be completed. The number of fixtures to use in each case is entirely dependent upon the nature of the work. When there is a large amount of work of the same kind to be done, several fixtures of the same *type* are made up for the same piece, and when in use these fixtures are placed in a row on the table of the machine.

Gang-planing Fixtures. — It is very common in planer practice to locate a number of duplicate castings or forgings in a row extending lengthwise of the table and then plane them all at the same time. Gang planing is often done without a special fixture, by simply clamping the work directly upon the table, but fixtures make it possible to set up work more rapidly and accurately. Besides many pieces are of such a shape that a fixture is necessary in order to hold them in the correct position for planing. An example of work requiring a fixture is shown in Fig. 28. Twenty-three forgings are planed at one time and four cutting tools are used, two being held in the side heads while two are attached to the heads of the cross-rail. The forgings are located at right angles to the length of the planer table